REMARKS

Claims 1-5, 7-8, and 10-36 appear in this application for the Examiner's review and consideration. Of these, new claims 33-36 have been added, and claims 1, 23, 29, and 32 are presently amended. The new claims and amendments are fully supported in the originally filed specification, claims, and drawings.

In the Office Action, claims 1-5, 7, 8, 10-13, 15-19, 21-25, 27-29, 31, and 32 were rejected under 35 U.S.C. § 102(b) over Sugioka. Claim 1 is directed to a vehicle frame that includes first and second frame portions. The first frame portion has a plurality of struts associated with each other to form a first framework to support the frame, and the second frame portion is separably associable with the first framework of struts in an association in which it significantly increases the stiffness thereof. The associated first frame and second frame portion cooperatively define and substantially enclose an interior cavity between them, and the interior cavity is dimensioned to house a component of the propulsion system propelling the vehicle. Additionally, claim 1 recites that the struts of the framework include a first, higher strut, a second, lower strut, and a third strut that is offset horizontally with respect to the other two. These struts are disposed around and define a portion of the cavity.

Claim 23 also defines a lower framework formed by the struts to support the frame, an upper frame portion comprising a skin member substantially increases the stiffness of the lower framework, and the interior cavity that is defined between the lower framework and the upper frame portion. Other elements are also recited, including a seat mounted on the upper frame portion, and an electrical energy source housed within the interior cavity, an electric motor connected and powered by the energy source to propel the vehicle. Two groups of struts of the framework are defined disposed on opposite sides of the cavity and defining a portion thereof.

The Office Action characterizes Sugioka as including a first frame portion with welded struts 102 through 104 and 118, with skin members 119 and 117, which allegedly include battery tray 112. A second frame portion is stated to include implements 103, 105, and 119, including struts 104a for stiffening the skin member and frame.

There are several problems, however, with this characterization of Sugioka. For instance, rear cover 119 is alleged to be both a skin member attached to the first frame portion, as well as part of the second frame portion that is associable with the

first frame portion to increase its stiffness. Additionally, component 103 is alleged to be both part of the first frame portion and of the second frame portion. Thus, the suggested construction of the Sugioka scooter cannot be made logically in the terms of the independent claims of the application.

Additionally, claims 1 and 23 define the framework that is made of a plurality of struts that is configured to provide support for the frame, and that the second frame portion is associable with the framework in a stiffening association therewith, for significantly increasing its stiffness. Also, the associated framework and second, or upper, portion define and substantially enclose the interior cavity that houses the component of the propulsion system with defined struts or groups of struts disposed around and on the sides of the cavity, defining portions of the cavity. The Sugioka scooter has a tubular frame that includes mainframe 103, floor frame 104, and rear frame 118. Rear cover 119 is disclosed as being "attached in such a manner as to circumvent the rear frame 118." (Sugioka 15:8-9.) Furthermore, as seen in the figures, the cover 119 is shown to merely extend around the rear frame 118. There is absolutely no teaching or suggestion that the rear cover 119 of Sugioka can have a sufficient structure and be attached to the frame in any way that it would provide a substantial increase in stiffness thereof. The traditional way that a cover such as cover 119 is attached is simply by mounting to the underlying tubular frame, but without providing any significant stiffness increase.

The Office Action additionally contends that the frame also defines the cavity that houses a battery. As evident from Figs. 29-31, and the related text, the battery case 112 of Sugioka is not part of a frame that supports the vehicle. To the contrary, the entire battery case 112 and batteries are merely suspended from member 158, via sponge strip 157 and rubber members 168 and 170. Since the battery case 112 is not part of the frame, the frame does not actually enclose any interior cavity that houses a component of a propulsion system. Long bolts 113,114 extend through brackets 135 and brackets on the floor frame 104. The long bolts, however, are not shown as a structural member that actually couple the battery case 112 to torsionally stiffen the floor frame 104. Claim 24 specifically recites the contribution to stiffness of the battery frame, and this claim is patentably distinct for this reason as well.

Finally, Sugioka does not include any arrangement of struts as defined in claims 1 or 23. The only struts that Sugioka arguably has are the floor frame 104, and these are merely parallel to each other. There is no other strut that is above or below the

frame 104 struts that is part of the same framework and that surrounds and encloses a cavity as defined. There is also no other strut that together with the floor frame struts of Sugioka can define any sides of the cavity or are disposed on opposite sides thereof.

The presently claimed inventions of claims 1 and 23 provide the surprising benefit over the references of record that they can provide a framework that is stronger and lighter than the traditional vehicle frames since the struts and framework extend around the cavity that houses propulsion components, bending moments of inertia of the framework can be maximized, and the cavity is naturally protected by structural members. The construction using a framework of struts is particularly beneficial in that it allows flexibility in spreading the load paths while not requiring very thick skins to resist denting of the structural member. Also, the second frame portion is surprisingly used to significantly further stiffen the framework, which can thus decrease the weight and size of spaced out framework struts that define the cavity.

On the other hand, in Sugioka, the structural frame portion of the vehicle is only provided in a vertically narrow portion of the scooter at any point along the vehicle. It does not take advantage of additional struts as claimed to define an interior cavity. New claims 33-36 further define aspects of the arrangement of the struts, for which there is no teaching or suggestion in any of the references of record, and which are further beneficial in providing the surprising advantages over the art discussed herein. Thus, claims 1, 23, and 33-36 are neither taught nor suggested by the art of record.

With regard to claims 25, 27, and 28, which define interior volumes of the cavity, this is not a mere matter of design. These large volumes are far larger than any cavity that is possibly defined by the frame of Sugioka. Additionally, these large volumes allow the frame to have a large bending moment of inertia, which can provide further stiffness with much less weight than the structure provided in Sugioka. Consequently, these claims are also neither taught nor suggestion in the art. The Office Action contends that, in interpreting claim 32 broadly, all of the struts of Sugioka are in compression. Even with such an overreaching broad interpretation, one of skill in the art would understand that under a normal loading, the longitudinal struts 104 of Sugioka are not in compression. They are purely in a bending stress condition neither under compression or tension, since there is no other portion of the structure that could cause these struts 104 to be in compression.

Additionally, even taking the Examiner's argument that the floor skin 105 is a frame member that can provide structural support, for which there is insufficient

teaching or suggestion in the Sugioka reference, then the frame members 104 would actually be the lowest portion of any frame, and would be in a condition of tension, not compression. The invention of claim 32 provides the surprising benefit that spaced struts that are in compression due to their arrangement in the scooter frame can be made with light weight and with less bracing, since the second or upper frame portion is used to increase their stiffness, while defining part of the cavity. As a result, far more access to the interior cavity can be provided without blocking access with cross pieces or by providing a much heavier structure. For this additional reason, claim 32 is patentably distinct over Sugioka.

With regard to claim 18, the argument is presented in the Office Action that the combination of the various portions recited by the Examiner increase the longitudinal torsional stiffness of the tubular frame plus other members mentioned, inherently, by a factor of at least 1.2. There is absolutely no support for this allegation of inherency. An increase in a factor of 1.2 means that the frame is 20% stiffer that it would be without, for example, the skin 105. Most likely, any increase in stiffness provided by the attachment to the skin or any of the other members would be far less than 20%, and typically it is insignificant. As indicated above, Sugioka teaches a traditional tubular frame, where almost all of the stresses are carried by the tubular portion. Everything else that is mounted thereon in Sugioka merely provides a fairing, or a surface to rest one's feet, or support for batteries, etc. But one of ordinary skill in the art would not have found any inherency that the combination of those members would provide such a large increase in stiffness of the frame as claimed.

With respect to claim 25, it would not be possible to achieve in Sugioka such a large volume as claimed. The Sugioka battery case is disposed below the floor and between the wheels, and such a modification to increase the volume by that elastic amount would involve a significant redesign, if even possible with the disclosed structure, that it would clearly not be readily feasible, and certainly not obvious. Claim 25 is thus patentable on its own merits as well.

Claim 26 was rejected under U.S.C. § 103(a) over Sugioka. The height of 15 inches is not a mere matter of altering dimensions of the Sugioka frame. As shown in Sugioka, the frame members 104 extend very low, and the entire battery compartment is held beneath them and beneath the floor scan 105. It would not be possible to increase the height of the alleged cavity of Sugioka to at least being 15", since the batteries would then drag on the ground. Conversely, raising frame members 104 would raise the floor

for the rider's feet, making for an uncomfortable seating position, or an undesirably raised center of gravity. The Sugioka teaching does not disclose or suggest any manner of obtaining such a tall cavity using its frame. Additionally, the tall height of the cavity claimed further increases the bending moments of inertia of the inventive frame, further allowing a lighter structure to be provide while also providing a very large and easily accessible interior cavity to house sizeable components, such as batteries or other propulsion systems. Claim 26 is thus patentable over the references.

Claims 14 and 30 were rejected under 35 U.S.C. § 103(a) over Sugioka, in view of Stevenson and Ono.

There is no motivation to combine Sugioka with either or both Stevenson and Ono since the types of construction of the frames of Stevenson and Ono are significantly different than the type of frame provided in Sugioka. The Stevenson and Ono frames are basically monocoque frames, while the Sugioka frame is the standard welded tube and strut construction. One of ordinary skill in the art would not have found motivation to use the skins of Stevenson or Ono since the Sugioka frame is structurally complete just with its tubes and struts, while the other references use single-piece molded skins. For example, skin 105 is merely provided in this type of frame to provide a floor, not to support the frame itself. There is also no suggestion or motivation to attach the skins of Stevenson and Ono to Sugioka, since it is unclear how any of the skins of Stevenson and Ono could be made to fit to the tubes of Sugioka in the first place. Stevenson and Ono are not readily modifiable in this manner, being the basic structural members of the monocoque, as opposed to tubular frame, construction. Consequently, even if the teachings of these three references were somehow combined, the product would not result in the claimed frame with a framework of struts that along with a separable second frame portion defines an interior cavity to house propulsion components, with stiffening skin members additionally provided made out of the recited materials. Thus, claim 14 is also patentably distinct over the references.

Claim 30 further recites that both the struts and skin members of the first frame portion are made of aluminum or an alloy thereof, and are welded together. This is also not taught or suggested in any of the references, and provides a particularly advantageous semi-monocoque construction, with structural materials that are positively coupled by welding to increase the frame stiffness. These claims have more significance that merely the recited materials, and they are patentably distinct from the references. There is also no motivation to weld the skins of Sugioka, since these are fairings, and are

required to be removable to access the frame itself as well as portions on the interior of the scooter.

In view of the foregoing, applicants believe that the entire application is now in condition for allowance, early notice of which would be appreciated. Should the Examiner not agree, then a personal or telephonic interview is respectfully requested to discuss any remaining issues in an effort to expedite the allowance of this application.

Respectfully submitted,

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